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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER

SEMENENKO, YURIY

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER MIGUEL MARTINO

Appeal 2008-0954
Application 10/652,847
Technology Center 2800

Decided: May 30, 2008

Before KENNETH W. HAIRSTON, JOHN A. JEFFERY
and KEVIN F. TURNER, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1-10 and 16-20. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

INVENTION

Appellant's claimed invention is to various embodiments of land grid array (LGA) packages in which substrate reinforcement member(s) are employed to reduce mechanical stress in the substrate and/or the adhesive material that attaches the package lid to the upper surface of the die (Spec. 4:¶[0010]). The substrate reinforcement member(s) may be attached to the upper surface of the substrate to reduce mechanical stress (Spec. 4:¶[0010]). The substrate reinforcement member(s) are not attached to the package lid. By separating the substrate reinforcement member(s) from the package lid, these components may be independently designed with appropriate thermal and mechanical properties (Spec. 4:¶[0010]). The coefficient of thermal expansion of the substrate reinforcement member(s) may be advantageously matched with the coefficient of thermal expansion of the substrate to reduce thermally induced stress (Spec. 4:¶[0012]).

Claim 1 reproduced below, is representative of the subject matter on appeal:

1. A land grid array (LGA) package for clamping to an interposer socket on a printed circuit board, the LGA package comprising:
 - a substrate;
 - a die attached to an upper surface of the substrate;

a lid attached to an upper surface of the die; and
a substrate reinforcement member attached to the upper surface of the substrate and separated from the lid.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Gungor	US 5,944,097	Aug. 31, 1999
McCutcheon	US 5,958,556	Sep. 28, 1999
Baba	US 6,313,521 B1	Nov. 06, 2001
Toy	US 6,333,460 B1	Dec. 25, 2001
Coffin	US 2002/0079117 A1	Jun. 27, 2002
Alcoe	US 2002/0135063 A1	Sep. 26, 2002
Kutlu	US 6,472,762 B1	Oct. 29, 2002

The following rejections are before us for review:

1. Claims 1, 16, 18, and 19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coffin and Kutlu.
2. Claims 2, 8, and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coffin in view of Kutlu and further in view of Baba.
3. Claims 3 and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coffin in view of Kutlu and further in view of McCutcheon.

4. Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Coffin in view of Kutlu and further in view of Toy.

5. Claims 4, 6, and 7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coffin in view of Kutlu and further in view of Gungor.

6. Claims 9 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Coffin in view of Kutlu and further in view of Alcoe.

OBVIOUSNESS

Independent claims 1 and 16, were argued separately (Br. 13). Appellant has presented no further arguments as to the additional references of Gungor, McCutcheon, Baba, Toy, and Alcoe used in rejecting claims 2-10, and 17-20, but instead relies on the arguments provided for claims 1 and 16 (Br. 8-13). Thus, claims 2-10, and 17-20 will stand or fall with claims 1 and 16, respectively.¹

There are two obviousness issues before us regarding whether Appellant has shown that the Examiner erred in rejecting claims 1-10 and 16-20 under 35 U.S.C. § 103(a).

¹ Only arguments made by Appellant have been considered in this decision. Arguments which Appellant could have made but did not make in the Brief have not been considered and are deemed waived. *See* 37 C.F.R. § 41.37(c)(1)(vii) (2004).

The two issues are:

A. With respect to claim 1, does the Examiner's articulated reasoning of alleviating the necessity of matching the coefficient of thermal expansion possess a rational underpinning to support the legal conclusion of obviousness?

B. With respect to claim 16, does the Examiner's articulated reasoning of reducing mechanical stress in the substrate possess a rational underpinning to support the legal conclusion of obviousness?

FINDINGS OF FACT

The relevant facts include the following:

1. Kutlu teaches that when the stiffener 116 (i.e., substrate reinforcement member) is joined to the substrate 106, the stiffener 116 may have a coefficient of thermal expansion (CTE) similar to the CTE of the substrate (col. 3, ll. 60-64).
2. Kutlu teaches that the headspreader (i.e., lid) generally has a CTE that is greater than the substrate (col. 3, ll. 3-5).
3. Kutlu describes as an advantage of his invention the reduction or elimination of substrate cracking (col. 2, ll. 16-17).
4. Kutlu teaches the use of optional stiffeners/substrate reinforcement members (i.e., separate substrate reinforcement members from the headspreader/lid) (col. 2, l. 17 and Figure 4).
5. Kutlu acknowledges as prior art that stiffeners/substrate reinforcement members are generally used to prevent excess warpage (col. 1, ll. 52-53).

PRINCIPLES OF LAW

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”)

The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, then the burden shifts to the Appellant to overcome the prima facie case with argument and/or evidence. *Id.*

The Examiner’s articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The Supreme Court, citing *In re Kahn*, 441 F.3d at 988, stated that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. at 1741. However, “the analysis need not seek

out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.*

ANALYSIS

Appellant argues that “the lack of motivation is evidenced by the lack of proper support as to where in the cited art reference the asserted benefits are disclosed” (Br. 13). Appellant further states: “corresponding to claim 1, it is alleged that the benefit of ‘separating a substrate reinforcement member from the lid is eliminate of necessity to match the coefficient of thermal expansion.’ ([sic]; emphasis added) However, no support in any of the cited references for this alleged benefit is provided in the FINAL Office Action” (Br. 13).

Appellant further states: “corresponding to claim 16, it is alleged that the benefit of including in *Coffin* that a ‘substrate reinforcement member attached to the upper surface of the substrate and being adapted’ is ‘to reduce mechanical stress in the substrate.’ ([sic]; emphasis added). Again, no support in any of the cited references for this alleged benefit is disclosed” (Br. 13).

The Examiner responds that the motivation statement to combine the references is provided by Kutlu in col. 2, ll. 8-22, by stating:

Kutlu clearly discloses architecture for an enhanced package using a high CTE heatspreader (lid) that may (i) match the coefficient of thermal expansion (CTE) of the die and heatspreader combination and the CTE of the substrate, make use of an optional (separate) stiffener to reduce stress at the . . . and increase the board level reliability of solder joints under the die, and/or (x) increase the component and board level reliability of the flipchip package (Kutlu, column 2, lines

Appeal 2008-0954
Application 10/652,847

8-22) . And furthermore Kutlu teaches basically similar to Applicant' LGA package structure for flipchip package structure, which has experienced same problems as LGA package disclosed by Applicants [sic] in application. Kutlu describe such problems in details in the "Background of the invention" section (column 1, lines 43-59).

(Ans. 12).

Thus, we agree with the Examiner's findings of facts and conclusions as set out in the Answer and adopt them as our own. We add the following primarily for emphasis.

A. Does the Examiner's articulated reasoning of alleviating the necessity of matching the coefficient of thermal expansion possess a rational underpinning to support the legal conclusion of obviousness?

Kutlu teaches that when the stiffener 116 (i.e., substrate reinforcement member) is joined to the substrate 106, the stiffener 116 may have a coefficient of thermal expansion (CTE) similar to the CTE of the substrate (Finding of Fact 1). Kutlu further teaches that the headspreader (i.e., lid) generally has a CTE that is greater than the substrate (Finding of Fact 2).

Thus, separating the substrate reinforcement member from the lid eliminates the necessity of matching their coefficients of thermal expansion while allowing the lid to have a greater CTE than the substrate CTE (Findings of Fact 1 and 2).

Therefore, the Examiner's articulated reasoning possesses a rational underpinning to support the legal conclusion of obviousness (Findings of Fact 1 and 2). *In re Kahn*, 441 F.3d at 988.

B. Does the Examiner's articulated reasoning of reducing mechanical stress in the substrate possess a rational underpinning to support the legal conclusion of obviousness?

Kutlu describes as an advantage of his invention the reduction or elimination of substrate cracking (Finding of Fact 3) as well as the use of optional stiffeners/substrate reinforcement members (i.e., separate substrate reinforcement members from the headspreader/lid) (Finding of Fact 4). Furthermore, it is acknowledged as prior art that stiffeners/substrate reinforcement members are generally used to prevent excess warpage (Finding of Fact 5).

Thus, separating a substrate reinforcement member would reduce mechanical stress in the substrate (Findings of Fact 3-5).

Therefore, the Examiner's articulated reasoning possesses a rational underpinning to support the legal conclusion of obviousness (Findings of Fact 3-5). *In re Kahn*, 441 F.3d at 988.

Finally, Appellant's mere recitation of the rejections and motivation statements used to reject claims 2-10, and 17-20, (Br. 8-10), is not considered an argument of patentability. As stated *supra*, Appellant has not met his burden of overcoming the prima facie case made by the Examiner with argument and/or evidence. *In re Oetiker*, 977 F.2d at 1445.

For the foregoing reasons we find that the Examiner did not err in rejecting claims 1-10 and 16-20 under 35 U.S.C. § 103(a).

Appeal 2008-0954
Application 10/652,847

CONCLUSIONS OF LAW

We conclude that the Appellant has not shown that the Examiner erred in rejecting claims 1-10 and 16-20 under 35 U.S.C. § 103(a).

DECISION

The decision of the Examiner to reject claims 1-10 and 16-20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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HEWLETT PACKARD COMPANY
P. O. BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400